



EPA Region 7 TMDL Review

TMDL ID	373	Water Body ID	IA-04-RAC-00530-L
Water Body Name	Storm Lake		
Pollutant	Turbidity		
Tributary	Powell Creek		
State	IA	HUC	0710000603
Basin	Des Moines River		
Submittal Date	3/7/2005		
Approved	yes		

Submittal Letter

State submittal letter indicates final TMDL(s) for specific pollutant(s)/ water(s) were adopted by the state, and submitted to EPA for approval under section 303(d) of the Clean Water Act.

A letter submitting this TMDL for approval was received by EPA on March 7, 2005.

Water Quality Standards Attainment

The water body's loading capacity for the applicable pollutant is identified and the rationale for the method used to establish the cause-and-effect relationship between the numeric target and the identified pollutant sources is described. TMDL and associated allocations are set at levels adequate to result in attainment of applicable water quality standards.

Loading capacity is calculated as the mass of suspended solids which would result in a lake water concentration of 20 mg/L of total suspended solids (TSS). With a lake volume of 30.8 million cubic meters this would be 680 tons in suspension at any one time. The present load is calculated at 1,620 tons resulting in an in-lake TSS concentration of 48 mg/L. The TMDL calls for a reduction of 28 mg/L or 940 tons. The target suspended solids concentration should meet applicable water quality standards.

Numeric Target(s)

Submittal describes applicable water quality standards, including beneficial uses, applicable numeric and/or narrative criteria. If the TMDL is based on a target other than a numeric water quality criterion, then a numeric expression, site specific if possible, was developed from a narrative criterion and a description of the process used to derive the target is included in the submittal.

The designated uses for Storm Lake are Primary Contact Recreation (Class A) and Aquatic Life (Class B(LW)). Storm Lake also has general secondary uses of secondary contact, domestic uses, and wildlife uses. Storm Lake was placed on the 2002 303(d) list for partial support of the primary contact recreation use. The applicable narrative water quality standard (IAC 567 61.3(2)c) states that "waters shall be from materials attributable to wastewater discharges or agricultural practices producing objectionable color, odor, or other aesthetically objectionable conditions."

The target for this TMDL is an in-lake total suspended solids concentration of 20 mg/L which will result from a suspension of 680 tons of sediment in the lake.

Link Between Numeric Target(s) and Pollutant(s) of concern

An explanation and analytical basis for expressing the TMDL through surrogate measures (e.g., parameters such as percent fines and turbidity for sediment impairments, or chlorophyll-a and phosphorus loadings for excess algae) is provided, if applicable. For each identified pollutant, the submittal describes analytical basis for conclusions, allocations and margin of safety that do not exceed the load capacity.

The linkage between the impairment and target is direct. The TMDL targets the suspended solids in the water column to ensure that the Secchi transparency is 0.7 meters. The TMDL shows that decreased transparency is impacted by suspended solids and not by algal chlorophyll. The Carlson's Trophic State Indices for total phosphorus, chlorophyll, and Secchi transparency show transparency does not conform to the expected relationship with chlorophyll and phosphorus. This indicates a high non-algal turbidity component to the decreased Secchi transparency. This sets the linkage between non-algal suspended solids and Secchi depth (transparency). Regression analyses also showed significant relationships between Secchi depth and both total suspended solids and inorganic suspended solids, but not with organic suspended solids or chlorophyll.

Source Analysis

Important assumptions made in developing the TMDL, such as assumed distribution of land use in the watershed, population characteristics, wildlife resources, and other relevant information affecting the characterization of the pollutant of concern and its allocation to sources, are described. Point, non point and background sources of pollutants of concern are described, including magnitude and location of the sources. Submittal demonstrates all significant sources have been considered.

The major source of suspended solids in Storm Lake is through wind driven resuspension of bottom sediments. A secondary source is runoff from the watershed. Streambed and bank erosion are a problem close to the lake where sediment delivery is high. With a mean depth of 8 feet, large areas of the lake are prone to resuspension at winds speeds of 12 miles per hour. With wind speed of 20 miles per hour there is potential for most of the lake bottom to be disturbed.

Allocation

Submittal identifies appropriate wasteload allocations for point, and load allocations for nonpoint sources. If no point sources are present the wasteload allocation is zero. If no nonpoint sources are present, the load allocation is zero.

The allocation for Storm Lake is set such that the in-lake total suspended solids concentration does not decrease the Secchi depth transparency to less than 0.7 meters. The required concentration has been determined to be less than 20 mg/L.

WLA Comment

There are no point sources for turbidity, the WLA is set at zero.

LA Comment

The LA is set as an annual average water column total suspended solids concentration of 20 mg/L (680 tons of sediment in the lake volume of 30.8 million cubic meters).

Margin of Safety

Submittal describes explicit and/or implicit margin of safety for each pollutant. If the MOS is implicit, the conservative assumptions in the analysis for the MOS are described. If the MOS is explicit, the loadings set aside for the MOS are identified and a rationale for selecting the value for the MOS is provided.

An explicit MOS of 68 tons per year is set. This is a 10 % reduction in the load allocation for total suspended solids.

Seasonal Variation and Critical Conditions

Submittal describes the method for accounting for seasonal variation and critical conditions in the TMDL(s).

The critical condition for which this turbidity TMDL applies is the entire year. This TMDL takes into account both resuspension during high winds and precipitation driven watershed sediment loads.

Public Participation

Submittal describes public notice and public comment opportunity, and explains how the public comments were considered in the final TMDL(s).

Public meetings were held in Storm Lake on November 20, 2003. A second meeting was held January 26, 2005 in the Storm Lake City Hall to review the draft TMDL. Comments received at these meetings, through the mail, and by email were reviewed and given consideration. One public comment noted inconsistencies in some lake parameters throughout the document. These were addressed in the main body of the TMDL, however, they remain in Appendix A. We note that the differences do not make a significant impact in calculations and in some cases may only be the result of rounding.

Monitoring Plan for TMDL(s) Under Phased Approach

The TMDL identifies the monitoring plan that describes the additional data to be collected to determine if the load reductions required by the TMDL lead to attainment of WQS, and a schedule for considering revisions to the TMDL(s) (where phased approach is used).

Follow-up monitoring will continue to meet, at a minimum, the minimum data requirements established by Iowa's 305(b) guidelines. An assessment will be completed by 2010 containing 3 lake samples per year for three years or 10 lake samples over a two year period. The City of Storm Lake and DNR will collect and analyze stormwater outfalls, the TMDL program will try to have the USGS conduct bathymetric mapping on the lake in 2006.

Reasonable assurance

Reasonable assurance only applies when reduction in nonpoint source loading is required to meet the prescribed waste load allocations.

No waste load allocation is included in this TMDL, reasonable assurances do not apply.
